

SCUTELLONEMA SPECIES AS CROP DAMAGING PARASITIC NEMATODES.

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Scutellonema species (Fig. 1) are generally found in warm climates associated with horticultural and agronomic crops including forest trees, and are distributed worldwide. There are currently some 38 described species, five of which are known to occur in Florida: S. brachyurum (Steiner, 1938) Andrassy, 1958; S. bradys (Steiner and LeHew, 1933) Andrassy 1958; S. clathricaudatum Whitehead, 1959; S. grande Sher, 1963; and S. minutum Sher, 1963 (= Rotylenchus minutus Germani, Baldwin, Bell & Wu, 1985).

Nematode Behavior: Scutellonema species are primarily ectoparasites of roots (Fig. 2). However, some species, such as S. brachyurum and S. cavenessi Sher, 1963 may invade roots and become semi-endoparasitic or endoparasitic. Another species, S. bradys (the yam nematode) is an endoparasite of plant roots and yam tubers (Dioscorea spp.). Nematode populations are capable of increasing to very high numbers on a suitable host in a very short time.

Some species of Scutellonema are remarkably well adapted to their environment. S. cavenessi is nearly ubiquitous in the Sahelian zone of Senegal, feeding on many of the weeds and all of the crops commonly grown there. A wide host range and the ability to survive soil desiccation permit S. cavenessi to maintain high population levels in a climate which commonly receives no rainfall for 9-10 month periods each year (3).

Symptoms: While Scutellonema spp. are associated with many agronomic and horticultural crops and they may increase to high numbers, there appears to be little outward sign of injury to the host. The exception to this is S. bradys which reproduces and increases to high numbers in stored yam tubers where it causes severe damage during storage. The nematodes may penetrate the primary roots from which they may enter directly into the tuber by cellular migration. Penetration may also occur through cracks or damaged areas on the suberized epidermis. The yam tubers take on a brownish discoloration. Peeled tubers appear dry and brown to black in color giving them a dry rot appearance termed "dry rot of yams" (2). A wet rot appearance may occur in storage due to bacterial attack on damaged tubers (2).

Distribution: Scutellonema spp. are most widespread in the tropical and semi-tropical areas worldwide with the greatest distribution and speciation in Africa (7). In California, they have been associated with some 85 plant species including many ornamentals and grapevines (8). Similarly, in Florida more than 250 vegetable, horticultural, ornamental, and citrus crops are infected by Scutellonema spp. They parasitize guarbeans in Queensland, Australia and are associated with roots of apricot, bananas, and many other horticultural and agronomic crops. Similar situations occur in Africa, India, Central and South America. The widespread

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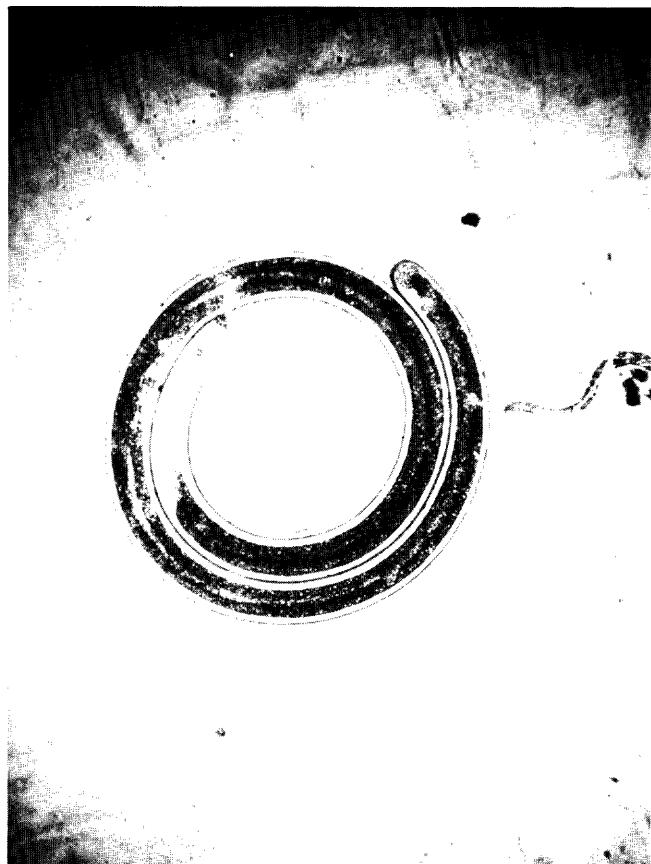


Fig. 1. Scutellonema brachyurum in typical curled position. (Courtesy R. P. Esser)



Fig. 2. Scutellonema species feeding ectoparasitically on a root. (Courtesy R. P. Esser)



Fig. 3. Peanut yield response to nematicide treatment (left) compared to untreated plant yield (right) in field experiments in the Sahelian zone of Senegal.

distribution of these nematodes is due mostly to a diverse host range and plant tolerance to infection.

Pathogen Status: Only rarely have Scutellonema species been implicated as causing economic damage. It was reported (4,6) that S. brachyurum was pathogenic to tobacco (Nicotiana tabacum) and Aloe vera under greenhouse conditions. In the field, however, this condition did not appear to be widespread and the damage was not extensive. Most reports concerning pathogenicity of Scutellonema species are limited to the yam nematode S. bradys which is the most pathogenic of all the species and is capable of causing severe economic damage to yams as stated above. In dryland areas of Senegal, field crops infested with high levels of S. cavenessi and other phytoparasitic nematodes frequently produce higher yields following preplant application of certain nematicides (1,5) (Fig. 3). Research is ongoing to determine how much of the responses to nematicides in various crops are due to nematode control. However, the preponderance of evidence suggests that most species of Scutellonema are weakly pathogenic and by themselves cause little or no economic losses.

Survey: In Florida, Scutellonema species are widespread in field and greenhouse soils. Plant stress may occur on some ornamental hosts under greenhouse conditions; however, there are few reports indicating that these species cause economic damage to their plant hosts.

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